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Research Commentary on IS/IT Role in Emergency and Pandemic Management: Current and Future Research

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ABSTRACT

IS/IT plays an important role in our everyday life, especially in today's Internet era. This article discusses the roles of IS/IT in providing services and support on information gathering, analysis, and management during major public emergencies and pandemic crises such as the battle against the new coronavirus. The five selected papers in this special issue introduce advanced methods on data collection and social media user analysis to deal with the challenges brought by the COVID-19 pandemic. This paper also presents future research directions on the use of IS/IT in emergency and pandemic management such as IS control and governance, intelligent health care, enhancing people's lives and mental health, and knowledge management.

KEYWORDS

COVID-19, Information System, Information Technology, Pandemic Management

INTRODUCTION

Information system and/or information technology (IS/IT) plays a pivotal role in information gathering, information analysis, information sharing, and information management during a crisis (Nah and Siau, 2020). The recent outbreak of the coronavirus (COVID-19) pandemic is bringing the world to its knees (Xie et al. 2020; Zou et al., 2020a; Zou et al., 2020b). By January 2021, more than 90 million COVID-19 cases have been reported worldwide and the pandemic has resulted in about two million deaths. All countries are affected and those countries that are most severely affected include the U.S., India, Brazil, Russia, UK, France, Turkey, Italy, Spain, Germany, and many others. To stop the spread of COVID-19, countries around the world have adopted enhanced public health responses such as closing their borders to all but their citizens, suspending intra-city public transport, banning public gatherings, and restricting the movement of residents. Although recent literature indicates that travel restrictions and transmission control measures are effective in delaying the spreading and limiting the size of the COVID-19 epidemic in China (Chinazzi et al. 2020; Tian et al. 2020), there is still an urgent need for greater understanding of existing and alternative public health actions, and

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what information systems (IS)/ information technology (IT) can offer in emergency and pandemic management.

BACKGROUND

It is widely known that IS/IT plays an important role in healthcare, clinical decision support, emergency response and preparedness, and disaster information management and planning (Ryoo and Choi, 2006; Fichman et al. 2011; Yang et al. 2012; Van De Walle et al. 2014; Chen et al. 2019). For example, data mining techniques can provide various data-driven classification systems (Lee & Siau, 2001) for addressing the risk associated with different groups of prostate cancer patients (Churilov et al. 2005). From the post-analysis of major extreme events, it is revealed that information sharing is critical for effective emergency responses (Chen et al. 2013). In large-scale emergencies, IS/IT solutions have been developed to enhance inter-agency flows of information, communication, and coordination (Aedo et al. 2010). However, IS/IT emergency management solutions may not be optimally designed for pandemic cases when the situation is constantly changing and evolving, and decisions need to be made in real-time with incomplete and dirty data. Further, trust, privacy, and ethical issues cannot be ignored during a crisis (Wang and Siau, 2019a, b; Siau and Wang, 2020). For example, the ethical issues related to access to medical services and devices when the hospitals are overwhelmed. We need more case studies, computing models, empirical studies, theoretical articles, mixed-method approaches, and advanced methodologies to understand, explain, predict, and manage pandemic crises such as COVID-19 (Gefen et al. 2011; Shiau and Chau, 2016; Sarker et al. 2018a,b; Chen et al. 2019; Shiau et al. 2019a; Hair et al. 2019; Khan et al. 2019; Chinazzi et al. 2020; Harrison et al. 2020; Shiau et al. 2020). Advanced technologies such as data analytics, data science, artificial intelligence, and machine learning can play a critical role in pandemic crisis management as well.

IS/IT Role in Emergency and Pandemic Management

COVID-19 continues to spread rapidly around the world. To combat this global public health crisis, global academics and practitioners cooperate to accelerate vaccine research and development. The information systems researchers have used information technology to combat the spread of the epidemic, manage and distribute COVID-19 information, and assist businesses to move online. Some academic databases quickly integrate and open resources related to COVID-19, and some world-renowned academic journals such as Nature and Science go into action by providing valuable research, commentary, and news of coronavirus for researchers. Academic papers start to appear in journals to join the “information fight against the epidemic”. For instance, deep learning has been applied to the modeling and identification of outbreaks. Martin et al. (2020) introduce a symptom-to-disease digital health assistant, named Symptoma, that can differentiate more than 20,000 diseases with an accuracy of more than 90%. Ning et al. (2020) collect and analyze open resources consisting of clinical data from patients with pneumonia for predicting COVID-19 outcomes by deep learning. Similarly, Dias et al. (2020) develop DeepLMS, a deep learning predictive model for supporting online learning for COVID-19.

The information flow during the epidemic is also an area of research. Gallotti et al. (2020) point out that not only the pandemic but also the co-evolving infodemic spread around the world are worth studying. For example, they find that measurable waves of potentially unreliable information preceded the rise of COVID-19 infections, exposing countries to falsehoods that pose a serious threat to public health. Some scholars focus on conversations on social media about the epidemic. Green et al. (2020) consider that accurate information and rapid behavioral change can save lives. They discover the tendency of members of Congress to discuss the epidemic on social media using tweets. Their results show that members of Congress quickly polarized along party lines in their views and communications regarding the crisis. Blasimme and Vayena (2020) indicate the privacy risks of COVID-19 apps especially the digital contact tracing (DCT) apps and suggest policy-makers setting

up mechanisms to govern these applications. On the whole, research on the application of information technology in epidemic prevention and control is indispensable. We hope to build “a Community of Shared Future for Mankind”, and the information community is an important component. Drew et al. (2020) develop a mobile APP named Coronavirus Pandemic Epidemiology (COPE), which is known as the COVID Symptom Tracker. Their application offers data on epidemic risk factors analysis, symptoms prediction, and geographical hotspots.

This special issue of the Journal of Database Management introduces advanced methods to deal with the challenges brought by the COVID-19 pandemic. The quantitative and qualitative papers in this special issue also help to understand the IS and IT-related phenomena associated with the COVID-19 pandemic. Based on the severe situation of COVID-19, Coronavirus pandemic modeling and prediction that can forecast the potential spread of Coronavirus is of great importance. Doganer and Zhang (2021) present the results of an infodemiological analysis that identifies the usability of Google Trends data in predicting and modeling COVID-19 outbreak. Using the trends, rankings, and relative search volume (RSV) of the searched words and other related Google Trends data across different countries, the results show a positive correlation between the RSV of the words searched on the Internet and the number of COVID-19 positive cases in countries and a negative correlation between the trend ranking of the words and the number of COVID-19 positive cases. Through the K modes clustering method, the attitudes of different countries are clustered according to the searched words in the search engine. Finally, the authors’ study reveals that Google Trends data can be used to build the prediction model of the COVID-19 pandemic. Despite modeling the outbreak of COVID-19, the need to understand life satisfaction is also important in pandemic management. Song et al. (2021) illustrate the influencing factors of people’s fear of missing out (FOMO) and study the correlations between FOMO, IT usage, and life satisfaction. The results show that people’s anxiety and boredom during the pandemic will increase their FOMO and people’s FOMO positively affects the social use and process use of IT devices. Further, the social use of ICTs is positively correlated with life satisfaction. The authors’ study provides insights into people’s mental health in pandemic cases.

During the outbreak of the COVID-19 pandemic, people are trapped at home and social media platforms have played a key role in information exchange and dissemination. However, the social media platform is a double-edged sword. There are various advantages with the responsible use of these tools, such as accessing up-to-date information, understanding the scientific progress, and studying novel treatment methods. The disadvantages include easily affected by negative emotions, giving credence to rumors, privacy concerns, and others. An et al. (2021) propose a method of identifying high-influence users on social media platforms based on topic consistency and emotional support, and divides the high-influence users of social media into three roles, i.e. topic initiator, opinion leader, and opinion reverser. By taking the event of “Jiankui He Editing the Infant’s Gene” as an example, the authors’ study builds the identification indicator system of high-influence users, which identifies the three types of users and reveals their opinion differences and dynamic evolution. Their findings provide a feasible way for emergency management departments to grasp the focus and emotional attitude of the key users and guide public opinion. Liu et al. (2021) explore the emotional composition, psychological characteristics, information needs, and the consistency of behavior and attitude of social media under the disaster environment. By means of Big-Five personality theory, Stimulus Organism Response (SOR) theory, and Self-difference theory, their results provide three kinds of psychological characteristics that social media users’ information behaviors reflect, and two kinds of characteristics of emotional needs of social media users. They also identify the inconsistency between social media users’ information behaviors and their attitudes. Their study will support the information management of emergencies and give guidance to public opinion and future research on social media users. From the perspective of affordance, Mirbabaie et al. (2021) study rumor-induced sense-making by focusing on Twitter affordances during a single emergency. Using the case study of the 2017 Manchester terrorist attack, their study assesses the role of rumors circulating on Twitter during the emergency management of the attack. The results of this study provide argumentative

grounds for the notion of sense-making as a consequence of affording social media and build on prior research to place sense-making as a cognitive process within the affordance concept. The contribution of this article is to provide some insights on how to prevent or control rumors on social media and give new perspectives to rumor research.

FUTURE RESEARCH DIRECTIONS

The COVID-19 will have a lasting impact on the life of individuals and the operations of organizations and governments. In the future, the role of IS/IT will become more and more prominent in IS control and governance, intelligent health care, enhancing people's lives, and knowledge management. For IS control and governance, the early IS control papers often view the IT artifact itself as the control target (Merten and Severance, 1981). With the evolution of digital infrastructures and platforms, recent research focuses on governance activities explicitly targeted at different contexts, like organizational performance (Wu et al., 2015). IS plays a critical role in managing data and other information during the pandemic. They provide up-to-date information, new scientific progress, and novel treatment methods for individuals and help the organizations and governments making the most informed decisions and policies as soon as possible. Information systems also offer services like immediate and efficient data access, data sharing, and data analysis, which help facilitate the prioritization in public health (<https://iris.paho.org/handle/10665.2/52127>). Also, the responsible information exchange and dissemination have the potential to improve emergency rescue. Further, it is essential to recognize what IT and digital technologies brought us. They provide platforms that enable people to share information and vent emotions, feelings, and thoughts during the pandemic. This is important for mental health. Also, organizations and governments have their own websites that can publish the latest updates and recent findings of the pandemic. The advanced development and innovative strategies of information technology make the quick COVID-19 response possible. To track the COVID-19 spread, contact tracing apps made a great contribution. Take China as an example, the government introduced the Alipay Health Code, which uses different colors to represent individual health condition, to monitor and trace the transmission of COVID-19 (Liang, 2020). Nowadays, big data and modern facial recognition technology enable governments to find people who may be infected and take necessary measures. IS/IT approaches can be applied in this area to help organizations and governments make quick decisions. As we discussed above, in the Post COVID-19 era, IS/IT can make a huge impact and we expect more meaningful and valuable research papers in this area to appear in the future (Agerfalk et al., 2020; Mykytyn, 2020).

For intelligent health care, the early IS health care papers were consistent with IS research done in traditional organizational contexts. IS researchers focused more on how to overcome the initial resistance to emerging health IT artifacts and how to better facilitate health IT adoption processes (e.g., Kohli and Kettinger, 2004). As the topics of IS health care diversified, recent research focuses on the impact of health IT use on patients such as the impact of wearable health IT on personal fitness activity (Adapa et al., 2018; James et al., 2019). Also, the design and use of algorithms and analytics such as the impact of health IT and analytic models on chronic disease outcomes (Bardhan et al., 2020). The current research on IS/IT is just the tip of the iceberg while there are various problems and issues related to IS/IT that are worth exploring. Among these, the most attractive field that IS/IT can play a part in is intelligent health care. There are many digital tools and modern technology that are applied in hospitals and healthcare facilities including intelligent healthcare systems and big data analysis software. We can also see intelligent healthcare systems used at home for remote diagnosis. These tools and systems not only help medical professionals better allocate, monitor, and treat patients, but they also record first-hand data which are precious resources in combating the COVID-19. Studies on digital information infrastructures for pandemic management are meaningful. In terms of the application of novel digital tools and technology, researchers will also be interested in individual, organizational, and governmental responses.

Another urgent issue to address is the impact of the pandemic on people's lives and mental health. Key themes in this area include education, work, entertainment, and use of social media. Due to the COVID-19 crisis, people have to work or study at home (Zou et al., 2020a). Under such circumstances, remote learning and working become common (Xie et al., 2020). Through new types of technologies and systems, schools and companies can provide remote communication and sharing of information with students and employees (Zou et al., 2020b). These alternative learning and working pathways significantly changed people's lives and how these tools can be effectively and efficiently utilized today is still a challenge for both individuals and organizations. Further, it is interesting to study security problems involving remote learning and working, especially in the transfer of classified documents and confidential data. The need for entertainment and social media platforms is also indispensable in pandemic management. For individuals, appropriate entertainment and connection to social media are helpful to vent emotions and reduce stress. With the COVID-19 pandemic, the global online entertainment market started to boom. Social media platforms also played a key role in information exchange and dissemination (Liu et al., 2020). Studies on the short- and potential long-term impacts of emerging online entertainment and social media systems on people, organizations, and society are needed.

For knowledge management, it is a systematic process to acquire, organize, and communicate individual knowledge so that others may make use of it (Beck et al., 2014). In early KM research, the research covers broad topics such as knowledge creation, knowledge transfer, knowledge contribution, KM within organizations, KM processes, design of KM systems, and antecedents of KM (e.g., Nah et al., 2002). Later, KM research focuses on strategies for managing knowledge, the use of KM systems, and the consequences of KM (e.g., Nah et al., 2005). Recently, KM research emphasizes the impact of KM on innovation (Trantopoulos et al., 2017) and performance (Zhang, 2017). As the effect of the COVID-19 pandemic grows, research on knowledge sharing and distribution for emergency and pandemic management is necessary such as the factual and fake information and knowledge on the social network, social media (e.g., Facebook, Tweeter), and mobile IS (Shiau et al., 2017, 2018, 2019b; Siau, 2002). Even post-pandemic, research on the use of KM for emergency and pandemic management, and related KM systems will remain relevant and important. Researchers can focus not only on individuals and enterprises, but also on the community, city, and country-level KM. The effect of national culture on the sharing of knowledge in pandemic management is also an important area of research (Shiau et al. 2010).

CONCLUSION

IS/IT has been a valuable tool during the current COVID-19 pandemic. Discussing novel methods and IS/IT applications, the papers in this special issue offer helpful and insightful suggestions on the use of IS/IT for emergency and pandemic management. The findings and viewpoints of these papers provide new perspectives to deal with pandemic cases, especially the COVID-19 pandemic crisis.

To summarize, this special issue highlights the pivotal role of IS/IT in emergency and pandemic management. In addition to discussing the roles of IS/IT in combating pandemic crises such as COVID-19, this paper presents future research areas on the use of IS/IT in pandemic control and management.

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REFERENCES

- Adapa, A., Nah, F., Hall, R., Siau, K., & Smith, S. (2018). Factors Influencing the Adoption of Smart Wearable Devices. *International Journal of Human-Computer Interaction*, 34(5), 399–409. doi:10.1080/10447318.2017.1357902
- Aedo, I., Díaz, P., Carroll, J. M., Convertino, G., & Rosson, M. B. (2010). End-user oriented strategies to facilitate multi-organizational adoption of emergency management information systems. *Information Processing & Management*, 46(1), 11–21. doi:10.1016/j.ipm.2009.07.002
- Agerfalk, P. J., Conboy, K., & Myers, M. D. (2020). Information systems in the age of pandemics: COVID-19 and beyond. *European Journal of Information Systems*, 29(3), 203–207. doi:10.1080/0960085X.2020.1771968
- An, L., Hu, J., & Xu, M. (2021). (forthcoming). Profiling the Users of High Influence on Social Media in the Context of Public Events. *Journal of Database Management*.
- Bardhan, I., Chen, H., & Karahanna, E. (2020). Connecting Systems, Data, and People: A Multidisciplinary Research Roadmap for Chronic Disease Management. *Management Information Systems Quarterly*, 44(1), 185–200.
- Beck, R., Pahlke, I., & Seebach, C. (2014). Knowledge Exchange and Symbolic Action in Social Media-Enabled Electronic Networks of Practice: A Multilevel Perspective on Knowledge Seekers and Contributors. *Management Information Systems Quarterly*, 38(4), 1245–1270. doi:10.25300/MISQ/2014/38.4.14
- Blasimme, A., & Vayena, E. (2020). What's next for COVID-19 apps? Governance and oversight. *Science*, 370(6518), 760–762. doi:10.1126/science.abd9006 PMID:33184192
- Chen, L., Baird, A., & Straub, D. W. (2019). An Analysis of the Evolving Intellectual Structure of Health Information Systems Research in the Information Systems Discipline. *Journal of the Association for Information Systems*, 20(8), 1023–2074. doi:10.17705/1jais.00561
- Chen, R., Sharman, R., Rao, H. R., & Upadhyaya, S. J. (2013). Data model development for fire related extreme events: An activity theory approach. *Management Information Systems Quarterly*, 37(1), 125–147. doi:10.25300/MISQ/2013/37.1.06
- Chinazzi, M., Davis, J. T., Ajelli, M., Gioannini, C., Litvinova, M., Merler, S., & Viboud, C. et al. (2020). The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak. *Science*, 368(6489), 395–400. doi:10.1126/science.aba9757 PMID:32144116
- Churilov, L., Bagirov, A., Schwartz, D., Smith, K., & Dally, M. (2005). Data mining with combined use of optimization techniques and self-organizing maps for improving risk grouping rules: Application to prostate cancer patients. *Journal of Management Information Systems*, 21(4), 85–100. doi:10.1080/07421222.2005.11045826
- Dias, S. B., Hadjileontiadou, S. J., Diniz, J., & Hadjileontiadis, L. J. (2020). DeepLMS: A deep learning predictive model for supporting online learning in the Covid-19 era. *Scientific Reports*, 10(1), 1–17. doi:10.1038/s41598-020-76740-9 PMID:33199801
- Doganer, A., & Zhang, Z. (2021). (forthcoming). An Infodemiological Analysis of Google Trends in COVID-19 Outbreak: Predict Case Numbers and Attitudes of Different Societies. *Journal of Database Management*.
- Drew, D. A., Nguyen, L. H., Steves, C. J., Menni, C., Freydin, M., Varsavsky, T., ... Spector, T. D. (2020). Rapid implementation of mobile technology for real-time epidemiology of COVID-19. *Science*.
- Fichman, R. G., Kohli, R., & Krishnan, R. (2011). Editorial overview—the role of information systems in healthcare: Current research and future trends. *Information Systems Research*, 22(3), 419–428. doi:10.1287/isre.1110.0382
- Gallotti, R., Valle, F., Castaldo, N., Sacco, P., & De Domenico, M. (2020). Assessing the risks of “infodemics” in response to COVID-19 epidemics. *Nature Human Behaviour*, 4(12), 1285–1293. doi:10.1038/s41562-020-00994-6 PMID:33122812
- Gefen, D., Straub, D. W., & Rigdon, E. E. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *Management Information Systems Quarterly*, 35(2), iii–xiv. doi:10.2307/23044042

- Green, J., Edgerton, J., Naftel, D., Shoub, K., & Cranmer, S. J. (2020). Elusive consensus: Polarization in elite communication on the COVID-19 pandemic. *Science Advances*, *6*(28), eabc2717. doi:10.1126/sciadv.abc2717 PMID:32923600
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. doi:10.1108/EBR-11-2018-0203
- Harrison, R. L., Reilly, T. M., & Creswell, J. W. (2020). Methodological Rigor in Mixed Methods: An Application in Management Studies. *Journal of Mixed Methods Research*, *14*(4), 473–495. doi:10.1177/1558689819900585
- James, T. L., Wallace, L., & Deane, J. K. (2019). Using Organismic Integration Theory to Explore the Associations Between Users' Exercise Motivations and Fitness Technology Feature Set Use. *Management Information Systems Quarterly*, *43*(1), 287–312. doi:10.25300/MISQ/2019/14128
- Khan, G. F., Sarstedt, M., Shiau, W. L., Hair, J. F., Ringle, C. M., & Fritze, M. P. (2019). Methodological research on partial least squares structural equation modeling (PLS-SEM): An analysis based on social network approaches. *Internet Research*, *29*(3), 407–429. doi:10.1108/IntR-12-2017-0509
- Kohli, R., & Kettinger, W. (2004). Informating the Clan: Controlling Physicians' Costs and Outcomes. *Management Information Systems Quarterly*, *28*(3), 363–394. doi:10.2307/25148644
- Lee, S., & Siau, K. (2001). A Review of Data Mining Techniques. *Industrial Management & Data Systems*, *101*(1), 41–46. doi:10.1108/02635570110365989
- Liang, F. (2020). COVID-19 and Health Code: How Digital Platforms Tackle the Pandemic in China. *Social Media + Society*, *6*(3). Advance online publication. doi:10.1177/2056305120947657
- Liu, C., Tian, Q., & Chen, M. (2021). Distinguishing Personality Recognition and Quantification of Emotional Features Based on Users' Information Behavior in Social Media. *Journal of Database Management*.
- Liu, X., Zhang, B., Susarlia, A., & Padman, R. (2020). Go to YouTube and Call Me in the Morning: Use of Social Media for Chronic Conditions. *Management Information Systems Quarterly*, *44*(1), 257–283. doi:10.25300/MISQ/2020/15107
- Martin, A., Nateqi, J., Gruarin, S., Munsch, N., Abdarahmane, I., Zobel, M., & Knapp, B. (2020). An artificial intelligence-based first-line defence against COVID-19: Digitally screening citizens for risks via a chatbot. *Scientific Reports*, *10*(1), 1–7. doi:10.1038/s41598-020-75912-x PMID:33149198
- Merten, A. G., & Severance, D. G. (1981). Data Processing Control: A State-of-the Art Survey of Attitudes and Concerns of DP Executives. *Management Information Systems Quarterly*, *5*(2), 11–32. doi:10.2307/249221
- Mirbabaie, M., Amojó, I., & Stefan, S. (2021). Affording Twitter in Emergency Situations - The Occurrence of Rumor Sense-Making Affording Twitter in Emergency Situations. *Journal of Database Management*.
- Mykytyn, P. P. (2020). COVID-19 and its impacts on managing information systems. *Information Systems Management*, *37*(4), 1–5. doi:10.1080/10580530.2020.1818900
- Nah, F., & Siau, K. (2020). COVID-19 Pandemic – Role of Technology in Transforming Business to the New Normal. Springer.
- Nah, F., Siau, K., & Tian, Y. (2005). Knowledge Management Mechanisms of Financial Service Sites. *Communications of the ACM*, *48*(6), 117–123. doi:10.1145/1064830.1064836
- Nah, F., Siau, K., Tian, Y., & Ling, M. (2002). Knowledge Management Mechanisms in E-Commerce: A Study of Online Retailing and Auction Sites. *Journal of Computer Information Systems*, *42*(5), 119–128.
- Ning, W., Lei, S., Yang, J., Cao, Y., Jiang, P., Yang, Q., & Xiong, L. et al. (2020). Open resource of clinical data from patients with pneumonia for the prediction of COVID-19 outcomes via deep learning. *Nature Biomedical Engineering*, *4*(12), 1–11. doi:10.1038/s41551-020-00633-5 PMID:33208927
- Ryoo, J., & Choi, Y. B. (2006). A comparison and classification framework for disaster information management systems. *International Journal of Emergency Management*, *3*(4), 264–279. doi:10.1504/IJEM.2006.011296

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Sarker, S., Xiao, X., Beaulieu, T., & Lee, A. S. (2018a). Learning from First-Generation Qualitative Approaches in the IS Discipline: An Evolutionary View and Some Implications for Authors and Evaluators (PART 1/2). *Journal of the AIS*, 19(8), 752–774.

Sarker, S., Xiao, X., Beaulieu, T., & Lee, A. S. (2018b). Learning from First-Generation Qualitative Approaches in the IS Discipline: An Evolutionary View and Some Implications for Authors and Evaluators (PART 2/2). *Journal of the AIS*, 19(9), 909–923.

Shiau, W. L., & Chau, Y. K. (2016). Understanding behavioral intention to use a cloud computing classroom: A multiple model-comparison approach. *Information & Management*, 53(3), 355–365. doi:10.1016/j.im.2015.10.004

Shiau, W. L., Dwivedi, Y. K., & Lai, H. H. (2018). Examining the core knowledge on Facebook. *International Journal of Information Management*, 43, 52–63. doi:10.1016/j.ijinfomgt.2018.06.006

Shiau, W. L., Dwivedi, Y. K., & Yang, H. S. (2017). Co-citation and cluster analyses of extant literature on social networks. *International Journal of Information Management*, 37(5), 390–399. doi:10.1016/j.ijinfomgt.2017.04.007

Shiau, W. L., Sarstedt, M., & Hair, J. F. (2019a). Internet research using partial least squares structural equation modeling (PLS-SEM). *Internet Research*, 29(3), 398–406. doi:10.1108/IntR-10-2018-0447

Shiau, W. L., Yan, C. M., & Lin, B. W. (2019b). Exploration into the Intellectual Structure of Mobile Information Systems. *International Journal of Information Management*, 47, 241–251. doi:10.1016/j.ijinfomgt.2018.10.025

Shiau, W. L., Yuan, Y., Pu, X., Ray, S., & Chen, C. (2020). Understanding Fintech continuance: Perspectives from Self-efficacy and ECT-IS theories. *Industrial Management & Data Systems*, 120(9), 1659–1689. doi:10.1108/IMDS-02-2020-0069

Siau, K., Erickson, J., & Nah, F. (2010). Effect of National Culture on Types of Knowledge Sharing in Virtual Communities. *IEEE Transactions on Professional Communication*, 53(3), 278–292. doi:10.1109/TPC.2010.2052842

Siau, K., & Shen, Z. (2002). Mobile Commerce Applications in Supply Chain Management. *Journal of Internet Commerce*, 1(3), 3–14. doi:10.1300/J179v01n03_02

Siau, K., & Wang, W. (2020). Artificial Intelligence (AI) Ethics – Ethics of AI and Ethical AI. *Journal of Database Management*, 31(2), 74–87. doi:10.4018/JDM.2020040105

Song, X., Song, S., Zhao, Y., & Min, H. (2021). Fear of Missing Out (FOMO) toward ICT Use during Public Health Emergencies-An Investigation on Predictors and Outcomes. *Journal of Database Management*.

Tian, H., Liu, Y., Li, Y., Wu, C. H., Chen, B., Kraemer, M. U., & Wang, B. et al. (2020). An investigation of transmission control measures during the first 50 days of the COVID-19 epidemic in China. *Science*, 368(6491), 638–642. doi:10.1126/science.abb6105 PMID:32234804

Trantopoulos, K., von Krogh, G., Wallin, M. W., & Woerter, M. (2017). External Knowledge and Information Technology: Implications for Process Innovation Performance. *Management Information Systems Quarterly*, 41(1), 287–300. doi:10.25300/MISQ/2017/41.1.15

Van De Walle, B., Turoff, M., & Hiltz, S. R. (2014). *Information systems for emergency management* (Vol. 16). Routledge. doi:10.4324/9781315703473

Wang, W., & Siau, K. (2019a). Artificial Intelligence, Machine Learning, Automation, Robotics, Future of Work, and Future of Humanity – A Review and Research Agenda. *Journal of Database Management*, 30(1), 61–79. doi:10.4018/JDM.2019010104

Wang, W., & Siau, K. (2019b). Industry 4.0: Ethical and Moral Predicaments. *Cutter Business Technology Journal*, 32(6), 36–45.

Wu, S. P.-J., Straub, D. W., & Liang, T.-P. (2015). How Information Technology Governance Mechanisms and Strategic Alignment Influence Organizational Performance: Insights from a Matched Survey of Business and IT Managers. *Management Information Systems Quarterly*, 39(2), 497–518. doi:10.25300/MISQ/2015/39.2.10

Xie, X., Siau, K., & Nah, F. (2020). COVID-19 pandemic – Online Education in the New Normal and the Next Normal. *Journal of Information Technology Case and Application Research*, 22(3), 175–187. doi:10.1080/15228053.2020.1824884

Yang, L., Su, G., & Yuan, H. (2012). Design principles of integrated information platform for emergency responses: The case of 2008 Beijing Olympic Games. *Information Systems Research*, 23(3-part-1), 761-786.

Zhang, X. (2017). Knowledge Management System Use and Job Performance: A Multilevel Contingency Model. *Management Information Systems Quarterly*, 41(3), 811–840. doi:10.25300/MISQ/2017/41.3.07

Zou, C., Zhao, W., & Siau, K. (2020a). COVID-19 Calls for Remote Reskilling and Retraining. *Cutter Business Technology Journal*, 33(7), 21–25.

Zou, C., Zhao, W., & Siau, K. (2020b). COVID-19 Pandemic: A Usability Study on Platforms to Support eLearning. Academic Press.